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<p>(21) International Application Number: PCT/AU96/00607 (22) International Filing Date: 26 September 1996 (26.09.96) (30) Priority Data: PN 5641 26 September 1995 (26.09.95) AU <i>nucleot</i> (71) Applicant (for all designated States except US): AMRAD OPERATIONS PTY. LTD. [AU/AU]; 17-27 Cotham Road, Kew, VIC 3101 (AU). (72) Inventors; and (73) Inventors/Applicants (for US only): HILTON, Douglas, James [AU/AU]; 244 Research Road, Warrandyte, VIC 3113 (AU). WILLSON, Tracy [AU/AU]; 26 Fortuna Avenue, North Balwyn, VIC 3104 (AU). NICOLA, Nicos, A. [AU/AU]; 56 Churchill Avenue, Mont Albert, VIC 3127 (AU). GAINSFORD, Timothy [AU/AU]; 92 Wilson Street, North Carlton, VIC 3054 (AU). ALEXANDER, Warren, S. [AU/AU]; 13 Park Street, Moonee Ponds, VIC 3039 (AU). METCALF, Donald [AU/AU]; 268 Union Road, Balwyn, VIC 3103 (AU). NG, Ashley [AU/AU]; 62 Monash Avenue, Balwyn, VIC 3103 (AU). (74) Agents: HUGHES, E., John, L. et al.; Davies Collison Cave, 1 Little Collins Street, Melbourne, VIC 3000 (AU).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>

(54) Title: A NOVEL HAEMOPOIETIN RECEPTOR AND GENETIC SEQUENCES ENCODING SAME

(57) Abstract

The present invention is directed to a novel haemopoietin receptor or a derivative thereof and to genetic sequences encoding same. The receptor molecule and its derivatives and the genetic sequences encoding same of the present invention are useful in the development of a wide range of agonists, antagonists, therapeutics and diagnostic reagents based on ligand interaction with its receptor. The present invention particularly relates to a receptor for leptin.

CLAIMS:

1. An isolated nucleic acid molecule comprising a sequence of nucleotides encoding or complementary to a sequence encoding a haemopoietin receptor or a derivative thereof wherein said sequence of nucleotides or a complementary form thereof is capable of hybridising under medium stringent conditions to the oligonucleotide:

5'-(A/G)CTCCA(A/G)TC(A/G)CTCCA-3' [SEQ ID NO:1].

2. An isolated nucleic acid molecule according to claim 1 wherein said nucleic acid molecule comprises a nucleotide sequence or a complementary form thereof which hybridises under medium stringent conditions to the oligonucleotides:

5'-ACTAGCAGGGATGTAGCTGAG-3' [SEQ ID NO:4]

5'-CTGCTCCTATGATACCT-3' [SEQ ID NO:6]

5'-CCTCTTCCATCTTATTGCTTGG-3' [SEQ ID NO:7]

5'-ATCGGTCGTGACATAACAAGG-3' [SEQ ID NO:8].

3. An isolated nucleic acid molecule according to claim 2 wherein said nucleic acid molecule comprises a nucleotide sequence or a complementary form thereof which hybridises under medium stringent conditions to one or more of the following oligonucleotides:

5'-CTCAGCTACATCCCTGCTAGT-3' [SEQ ID NO:5]

5'-AGCTAAGCTTTCTAGATATCCAATTACTCCTTGGAGA-3' [SEQ ID NO:9]

5'-AGCTTCTAGATCAATCACTCTGGTGTTTTTCAAT-3' [SEQ ID NO:10]

5'-AGCTTCTAGATCAAACCTTTATATCCATGACAAC-3' [SEQ ID NO:11].

4. An isolated nucleic acid molecule according to claim 3 wherein the haemopoietin receptor is capable of interaction with leptin.

5. An isolated nucleic acid molecule according to claim 4 comprising a nucleotide sequence as set forth in SEQ ID NO:12 or is capable of hybridising to all or part thereof under low stringent conditions.

- 69 -

6. A recombinant haemopoietin receptor or a derivative thereof encoded by a nucleic acid molecule which comprises a nucleotide sequence or a complementary form thereof which is capable of hybridising to SEQ ID NO:1 under medium stringent conditions.
7. A recombinant haemopoietin receptor or its derivative according to claim 6 wherein said haemopoietin receptor is encoded by a nucleic acid molecule which comprises a nucleotide sequence or a complementary form thereof which is capable of hybridising to SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7 and SEQ ID NO:8 under medium stringent conditions.
8. A recombinant haemopoietin receptor or its derivative according to claim 7 wherein said haemopoietic receptor is encoded by a nucleic acid molecule which comprises a nucleotide sequence or complementary form thereof which hybridises under medium stringency conditions to one or more of SEQ ID NO:1 and SEQ ID NO:4 to SEQ ID NO:11.
9. A recombinant haemopoietin receptor or its derivative according to claim 8 wherein the haemopoietin receptor is capable of interaction with leptin.
10. A recombinant haemopoietin receptor or its derivative according to claim 9 encoded by a nucleic acid molecule comprising a nucleotide sequence or complementary form thereof substantially as set forth in SEQ ID NO:12 or a sequence capable of hybridising to all or part thereof under medium stringent conditions.
11. A recombinant haemopoietin receptor or its derivative according to claim 10 wherein said haemopoietin receptor has an amino acid sequence substantially as set forth in Figure 2 [SEQ ID NO:13] or having at least about 60% similarity to all or part thereof.
12. A nucleic acid molecule according to claim 1 or claim 6 wherein said haemopoietin receptor is of mammalian origin.

- 70 -

13. A nucleic acid molecule according to claim 12 wherein the haemopoietin receptor is derived from a human, livestock animal, laboratory test animal, companion animal or captive wild animal.
14. A nucleic acid molecule according to claim 13 wherein the haemopoietin receptor is derived from a human or murine species.
15. An antibody to the recombinant haemopoietin receptor according to any one of claims 6 to 11.
16. An antibody according to claim 15 wherein the antibody is a monoclonal antibody.
17. A ligand capable of binding to a haemopoietic receptor according to any one of claims 6 to 11.
18. A ligand according to claim 17 wherein the ligand is leptin.
19. A method of identifying a ligand capable of interacting with a haemopoietic receptor as defined in any one of claims 6 to 11, said method comprising contacting a biological sample containing a putative ligand with said haemopoietic receptor or a ligand binding portion thereof immobilised to a solid support for a time and under conditions sufficient for a complex to form between said receptor and said ligand if said ligand is present in said biological sample, eluting bound ligand and isolating same.
20. A pharmaceutical composition comprising a recombinant haemopoietin receptor according to any one of claims 6 to 11 or a ligand binding portion thereof and one or more pharmaceutically acceptable carriers and/or diluents.

- 71 -

21. A pharmaceutical composition comprising a ligand to the recombinant haemopoietin receptor according to any one of claims 6 to 11 and one or more pharmaceutically acceptable carriers and/or diluents.

22. A method of treatment in a mammal comprising administering to said mammal a treatment effective amount of a recombinant haemopoietin receptor according to any one of claims 6 to 11 or a ligand binding portion thereof or a ligand to said haemopoietic receptor for a time and under conditions sufficient for said treatment to be substantially effected or substantially ameliorated.